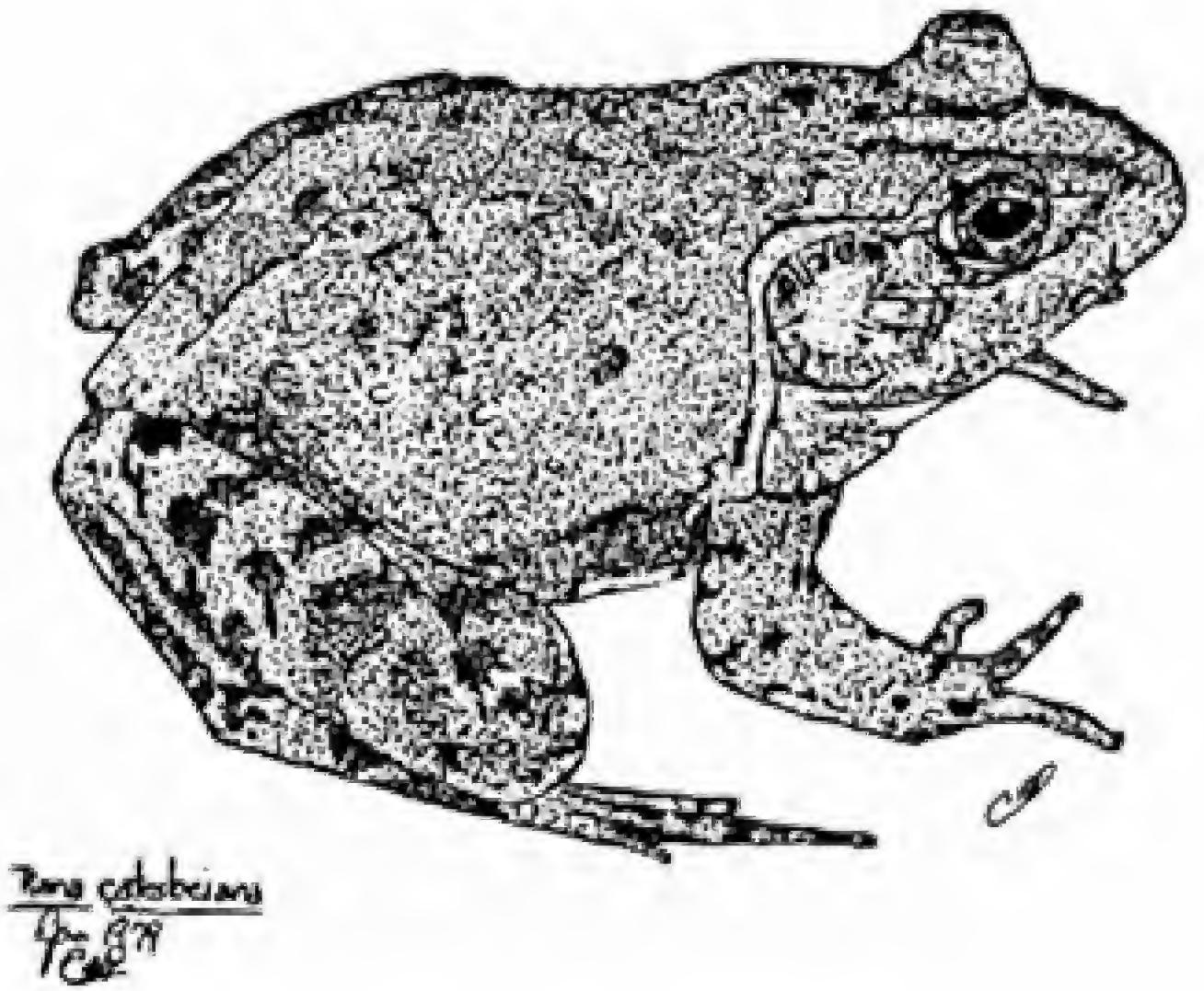
CATESBEIANA



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Manuscripts being submitted for publication should be typewritten (double spaced) on good quality 8½ by 11 inch paper, with adequate margins. Consult the style of articles in this issue for additional information, including the appropriate format for literature citations. The metric system should be used for reporting all types of measurement data. Computer diskettes (Word or WordPerfect format) are desired for longer papers. Submissions concerning the herpetofauna of selected areas, such as a state park or county, should be prepared in article rather than field note format. Articles will be refereed by the editor and at least one other qualified reviewer. All changes must be approved by the author before publication; therefore, manuscripts must be received by the editor before the first of March and September to be considered for publication in the spring or fall issue, respectively, of *Catesbeiana*. Reprints of articles are not available to authors; however, authors may reprint articles themselves to meet professional needs.

(Editorial policy continued on inside back cover)

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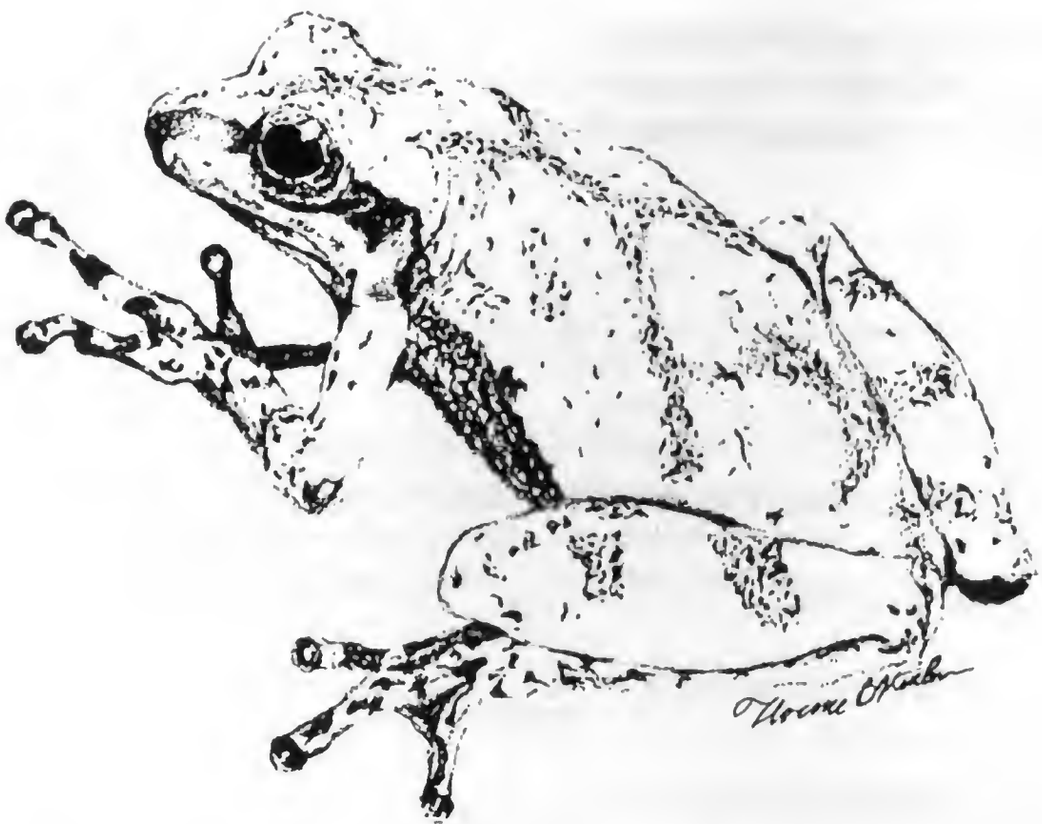

Checklist and Keys to the Amphibians and Reptiles of Virginia's Eastern Shore

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Current herpetofaunal diversity and distribution patterns on Virginia's Eastern Shore (Accomack and Northampton counties) probably resulted from three factors: (1) historical dispersal of some species from northern areas on the Delmarva Peninsula, (2) historical dispersal of some species from mainland Virginia across the Chesapeake Bay or when it was a riverine channel in the late Pleistocene when sea levels were lower, and (3) habitat alteration and loss brought about largely by agricultural activities practiced by European colonists and their descendants. The lower Delmarva Peninsula was much larger in the Pleistocene than it is today because sea levels dropped as much as 30 meters during full glacial advance (Blackwelder et al., 1979). It was connected to southeastern Virginia during the last half million years of the Pleistocene Epoch when the ancient Susquehanna River channel traversed the future peninsula as far north as Sussex County, Maryland (Colman et al., 1990). Sea levels rose following glacial retreat in the early Holocene and during that time various factors formed present day coastlines and barrier islands (Dolan et al., 1979, 1980). Changes in the environment associated with global climate change and sea level rise undoubtedly influenced herpetofaunal colonization patterns in this area. What the changes were will likely remain unknown because of the dearth of fossil records from Delmarva. The modern herpetofauna on Virginia's Eastern Shore may have been affected more by the loss and alteration of natural habitats, especially freshwater wetlands, caused by European agricultural practices. Natural sources of surface fresh water in Accomack and Northampton counties are limited in part because of the historical loss of pocosin-like wetlands (Pettry et al., 1979). Within the altered Eastern Shore environment we know that the modern amphibian and reptile fauna consists of 14 species of frogs, 5 salamanders, 12 turtles, 4 lizards, and 12 snakes (Tobey, 1985; Conant et al., 1990; Mitchell, 1994).

Very few amphibians or reptiles have been studied in any depth on the Eastern Shore (e.g., Dunson, 1986; Scott, 1986; Hranitz et al., 1993). None

has been studied from the perspective of population size and dynamics, life history traits, or movement ecology. This information is needed for the development of conservation and management plans. Thus, the basic natural history of Virginia's Eastern Shore herpetofauna contains large gaps that need our attention.

As interest in the natural history of the Eastern Shore and the Chesapeake Bay region grows (e.g., Meanley, 1981, 1982; Dueser, 1990; Mitchell and Anderson, 1994; Barnes and Truitt, 1997; Lippson and Lippson, 1997), an increasing number of people will encounter amphibians and reptiles and thus be able to provide observations useful to the scientific community.

The following keys are provided to assist with the identification of amphibians or reptiles found in Virginia's two Eastern Shore counties, Accomack and Northampton. These keys will work on adults and, in many cases, juveniles. They do not, however, include tadpoles and salamander larvae. See Travis (1981) for a key to tadpoles and Petranka (1998) for one to salamander larvae. I urge readers using these keys to provide their natural history observations to the state's Department of Game and Inland Fisheries nongame program (and to me), so that future work in this area can be based on a more complete database.

Brief History of Herpetofaunal Checklists for the Eastern Shore

The first checklist containing species occurrences for Virginia's Eastern Shore was provided by Dunn (1936), who listed a total of four species specifically for Accomack and Northampton counties. Conant (1945) provided an annotated checklist of the herpetofauna of Delmarva and noted the counties from which observations or museum specimens of each species were known. He included the two Virginia counties for 10 frogs, three salamanders, five turtles, two lizards, and eight snakes. In the 1950's, C. F. Reed published a series of distribution records and checklists on the herpetofauna of Delmarva based largely on the literature and his personal observations (Reed, 1956a, b, c, d, e, f, g, 1957, 1958). The Virginia Herpetological Society published three county-wide checklists in their bulletin series in the 1960's and 1970's: snakes (Witt, 1964), turtles (Virginia Herpetological Survey, 1968), and lizards (Anonymous, 1972). These checklists contained eight, four, and one species, respectively, for Accomack County and six, three, and two species, respectively, for Northampton County. Conant et al. (1990) provided a

complete checklist of the herpetofauna for most of the barrier islands that lie off the Virginia coast. This list included seven frogs, one salamander, 11 turtles, two lizards, and eight snakes. They also included counts of taxonomic groups that occur on mainland Eastern Shore (19 amphibians, 27 reptiles), but did not specify species.

The first formal checklist of species known to occur on the Eastern Shore of Virginia (Table 1) is derived here from Tobey (1985), Conant et al. (1990), Mitchell (1994), and Mitchell and Reay (in press). The list includes all species noted in earlier checklists, including modifications in Conant et al. (1990). Scientific names follow Mitchell and Reay (in press).

Keys to Amphibians and Reptiles

Additional available sources for species identification that should work well on the Eastern Shore are Martof et al. (1980) and Conant and Collins (1998) for all species, Mitchell (1994) for reptiles, Ernst and Barbour (1989) for snakes, Ernst et al. (1994) for turtles, and Petranka (1998) for salamanders. Anatomical terms used in the following keys are in these sources.

Key to Amphibians

Rear limbs much longer and more robust than front limbs.... Frogs and Toads (Anurans)
Rear limbs similar in size to front limbs ..... Salamanders

Key to Frogs and Toads

1A. Pupil of eye vertical (cat-like) or horizontal; one black, horny tubercle (spade) on rear of each foot 2
1B. Pupil of eye round; no black tubercle on rear of each foot 4

2A. Large, elongated, parotoid glands behind each eye; pupil horizontal; upper and lower hard tubercles (2) on rear of each foot 3
2B. Parotoid glands round and inconspicuous; pupil vertical; single, black tubercle on rear of foot ..... *Scaphiopus holbrookii*

3A. Black to brown blotches on back contain one wart; warts on upper thighs enlarged, the largest with horny projections.....*Bufo americanus*

3B. Blotches on back contain 2 or more warts; warts on upper thighs indistinct, not enlarged or tipped with horny projections.... *Bufo fowleri*

4A. Fold of skin behind the head; tip of snout narrow and distinctly pointed .....*Gastrophryne carolinensis*
4B. No fold of skin behind head; snout rounded 5

5A. Tip of each toe with a slightly to distinctly enlarged pad 6
5B. Tip of each toe without enlarged pad, no difference between width of penultimate toe joint and toe tip.....10

6A. Toe pads small, slightly wider than the penultimate toe joint; adult body length <36 mm 7
6B. Toe pads large, distinctly wider than the width of the penultimate toe joint 8

7A. Webbing between toes present; single stripe of brown, gray, green, or red along middle of back ..... *Acris crepitans*
7B. Webbing between toes absent; three dark brown to black stripes on back ..... *Pseudacris feriarum*

8A. Body color tan or pinkish, usually with large, dark brown "X" on back (may be broken)..... *Pseudacris crucifer*
8B. Body color green or gray, without "X" pattern on back 9

9A. Body color green, usually with a narrow yellow to white stripe along each side; inside of thighs yellow without markings; no white patch beneath each eye ..... *Hyla cinerea*
9B. Body color usually gray to greenish gray with irregular dark reticulations; inside of thighs yellow with dark mottling; white patch beneath each eye ..... *Hyla chrysoscelis*

10A. Dorsolateral fold present 11
10B. Dorsolateral fold absent ..... *Rana catesbeiana*

11A. Distinct round, squarish, or rectangular spots on back between dorsolateral folds 12
11B. Area between dorsolateral folds without enlarged spots 13

12A. Spots on back round and irregular in pattern; white spot in middle of tympanum ..... *Rana sphenocephala*
12B. Spots on back square or rectangular in shape and usually arranged in a double row between the dorsolateral folds; no light spot in tympanum ..... *Rana palustris*

13A. Dark, somewhat triangular patch passes through eye and tympanum; dorsolateral fold extends to groin ..... *Rana sylvatica*
13B. Upper lip usually green; no dark patch on side of head, dorsolateral fold extends to just beyond middle of back ..... *Rana clamitans*

Key to Salamanders

1A. Body chunky with white crossbars ..... *Ambystoma opacum*
1B. Body slender without white crossbars 2

2A. Body and tail green with small red spots; venter yellow with tiny black flecks ..... *Notophthalmus viridescens*
2B. Body color not green and without red spots; venter without tiny black flecks 3

3A. Two distinct dark, narrow stripes along back; venter immaculate yellow..... *Eurycea bislineata*
3B. Single stripe on back or without stripes; venter white or dark gray 4

4A. Body brownish with black specks; venter of body white with an irregular pattern of black spots; base of tail constricted .....*Hemidactylium scutatum*
4B. Body nearly black with reddish stripe or body color uniform like the sides; venter of body dark gray sometimes peppered with white; base of tail not constricted ..... *Plethodon cinereus*

Key to Reptiles

1A. Body covered in hard bony or leathery shell.....Turtles
1B. Body covered in small scales; limbs present or not 2

2A. Four legs present; distinct body and tail ..... Lizards
2B. No legs; body and tail not distinct ..... Snakes

Key to Turtles

1A. Front legs shaped like flippers 2
1B. Front legs not shaped like flippers 5

2A. Shell not hard, without scutes or plates, skin leathery..... *Dermochelys coriacea*
2B. Shell hard with scutes or plates 3

3A. One pair of plates on top of the head between the eyes and snout; four pleural scutes ..... *Chelonia mydas*
3B. Two pairs of plates on top of the head between the eyes and snout; five pleural scutes 4

4A. Large ovoid plate on top of the head; 3-4 small scutes along the underside of the carapace at the bridge ..... *Caretta caretta*
4B. No large ovoid plate on top of head; five small scutes along the underside of the carapace at the bridge ..... *Lepidochelys kempii*

5A. Tail long, about 1/2 length of upper shell with saw-toothed tubercles along the upper surface; plastron small and shaped into a cross ..... *Chelydra serpentina*
5B. Tail short, much shorter than shell; plastron nearly as large as the carapace 6

6A. Plastron with 11 scutes 7
6B. Plastron with 12 scutes 8

7A. White to yellow mottling on side of head; no skin visible between scutes along midline of plastron ..... *Kinosternon subrubrum*
7B. Two distinct white stripes on side of black head; skin visible between scutes along midline of plastron ..... *Sternotherus odoratus*

8A. Toes (not claws) not elongated and without webbing; shell high-domed (helmet like); plastron hinged in the middle ..... *Terrapene carolina*
8B. Toes elongated and with webbing between them; shell somewhat flattened; plastron not hinged 9

9A. Shell black with a variable number of yellow spots; head with small orange patch behind eye ..... *Clemmys guttata*
9B. Shell brown, black, or olive without distinct spots; head striped or mottled 10

10A. Carapace with sets of concentric grooves in each scute that may have concentric black to brown circles; head and neck with numerous small black spots on soft skin ..... *Malaclemys terrapin*
10B. Carapace without concentric grooves in shell; small black spots on skin absent 11

11A. Carapace with light transverse lines across the back at the junction of the pleural scutes; reddish markings in each marginal scute; two yellow spots behind the eyes ..... *Chrysemys picta*
11B. Carapace dark with a reddish vertical line in each pleural scute; marginal scutes lack distinct red markings; single, light middorsal stripe on top of snout bisecting a thin-lined arrowhead-shaped pattern ..... *Pseudemys rubriventris*

Key to Lizards

1A. Scales on body rough (keeled) and pointed posteriorly ..... *Sceloporus undulatus*
1B. Scales on body smooth, without keels 2

2A. Two narrow, dark brown to black stripes extending from tip of snout to middle of tail; body size <49 mm ..... *Scincella lateralis*
2B. Five yellowish to white stripes along back and sides or if stripes absent, body size >90 mm 3

3A. One or two enlarged scales between the last upper labial scale and the ear opening; usually 14-16 scale rows around the tail at a point 10 scales posterior to the anal plate; maximum body size 86 mm ..... *Eumeces fasciatus*
3B. No enlarged scales between the last upper labial scale and ear opening; scale rows usually 17-18 around tail at a point 10 scales posterior to the anal plate; body size to 143 mm .....*Eumeces laticeps*

Key to Snakes

1A. Series of brown hourglass-shaped crossbands on back; pit between eye and nostril; pupil vertical; most scales beneath tail entire, not divided ..... *Agkistrodon contortrix*
1B. No hourglass-shaped crossbands on back; pit absent; pupil round; all scales beneath tail divided 2

2A. Body color uniform, no pattern visible 3
2B. Body with pattern of blotches, crossbands, or stripes 6

3A. Dorsum black to blue black in color 4
3B. Dorsum brown or green; venter pink or white 5

4A. White on chin only; body round in imaginary cross section .....*Coluber constrictor* (adults)
4B. White on chin and approximately anterior third of venter; body shaped like breadloaf in imaginary cross section ..... *Elaphe obsoleta* (adults)

5A. Upper body uniform brown to tan in color; undersides pink ..... *Carphophis amoenus*
5B. Upper body uniform light green; undersides white to yellowish ..... *Opheodrys aestivus*

6A. White, yellow, or tan stripes along back 7
6B. No stripes on back; pattern consists of crossbands or blotches 9

7A. Row of small, paired black to dark brown spots along center of back outlining tan stripe ..... *Storeria dekayi*
7B. Distinct white to yellow stripes along midline of back 8

8A. Lateral stripes on scale rows 3 and 4, counting up from ventral plates ..... *Thamnophis sauritus*
8B. Lateral stripes on scale rows 2 and 3, counting up from ventral plates ..... *Thamnophis sirtalis*

9A. Tip of snout upturned and pointed ..... *Heterodon platirhinos*
9B. Tip of snout rounded 10

10A. Distinct white to yellow collar around neck; no other pattern visible on back ..... *Diadophis punctatus*
10B. No collar on neck; crossbands or blotches along back 11

11A. Upper body black to blue black with a series of thin, white to yellow crossbands, some of which fork on the sides ..... *Lampropeltis getula*
11B. Upper body brown to gray with brown to reddish blotches or crossbands 12

12A. Dark brown crossbands on anterior third of back; posterior two-thirds with alternating dark blotches along middle of back and on sides; venterusually with irregular series of half-moon spots ..... *Nerodia sipedon*
12B. Blotches nearly uniform in size, no crossbands; undersides without half-moon spots 13

13A. Body blotch count <40; anterior blotches with short anterior and posterior projections; dark brown to black eye-jaw stripe present ..... *Elaphe obsoleta* (juveniles)

13B. Body blotch count >50; no projections on blotches; eye-jaw stripe absent ..... *Coluber constrictor* (juveniles)

Discussion and Conclusions

The amphibians and reptiles of the lower Delmarva represent a subset of the herpetofauna known for the entire peninsula (Conant, 1945; Conant and Collins, 1998). A total of 25 species of amphibians and 36 species of reptiles has been documented for the Maryland and Delaware portions of the peninsula (Conant, 1945; Harris, 1975). Species that occur in neighboring counties in Maryland and may be found in Virginia with additional survey work include *Ambystoma tigrinum* (Somerset County), *Pseudotriton montanus* (Worcester County), *Rana virgatipes* (Worcester County), *Sternotherus odoratus* (Worcester County), *Elaphe guttata* (Somerset County), *Lampropeltis triangulum* (Worcester County), *Storeria occipitomaculata* (Somerset and Worcester counties), and *Virginia valeriae* (Worcester County) (Harris, 1975; Grogan and Forester, 1998).

Two other distributional problems need elucidation with additional field work. The *Eurycea bislineata* noted as questionable for Accomack County is based on a brief observation of one individual in Custis Creek (a degraded stream) 1.6 km SE Daugherty on 25 May 1986 (JCM, pers. obs.); there is no voucher specimen. Likewise, the record from Eastville in Northampton County (Conant, 1945; Tobey, 1985) is not supported by a voucher specimen. Additionally, the species of *Eurycea* occurring on Delmarva is undetermined, as there has been no genetic work to ascertain if it is *E. bislineata* or *E. cirrigera*. Known distribution patterns of these species in Virginia provide no insight into this problem (Mitchell and Reay, in press). Thus, inclusion of *E. bislineata* in the checklist and key should be considered probationary. *Thamnophis sirtalis* records have been substantiated for mainland Eastern Shore of Virginia (Mitchell, 1994; Hobson and Stevenson, 1995; Mitchell and Reay, in press), however, there are no verified records for any of the barrier islands in Virginia (Conant et al., 1990; Mitchell and Anderson, 1994). Harris (1975) illustrates a record for Assateague Island based on a single, unsalvaged, DOR specimen from the southern end of the island reported by Lee (1972). Thus, occurrence of this snake on barrier islands off Delmarva must be considered putative until verified with a specimen or photograph.

Why are there fewer species in the Virginia portion of the Delmarva Peninsula than in the Maryland portion? The answer may lie in the geological history of the two counties, which were apparently islands before the Pleistocene and cut off from northern terrestrial connections, and the massive habitat loss and alteration caused since Europeans arrived in the 1600's. Nevertheless, the composition of the various herpetofaunal assemblages present on Virginia's Eastern Shore offers numerous opportunities for scientific and natural history investigations. Among the basic natural history needs is the fact that we do not yet have a full understanding of the distributional patterns for any species. The life history or ecology of nearly every species is essentially unknown for this area. It follows that we will have little future impact on the conservation of Eastern Shore amphibians and reptiles or their habitats without knowledge of their basic natural history. All observations should be recorded in field notes and made available to the scientific community.

Acknowledgments

I thank Barry Truitt for his support of my interest in Virginia's Eastern Shore herpetofauna and for providing specimens and information.

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Table 1. Checklist of amphibians and reptiles on Virginia's Eastern Shore. Records are based on museum specimen locality records, Conant et al. (1990), Mitchell (1994), and my personal observations.

Species	Accomack	Northampton	Barrier Islands
Anurans			
Bufo americanus	x		
Bufo fowleri	x	x	x
Acris crepitans	x	x	
Hyla chrysoscelis	x	x	
Hyla cinerea	x	x	x
Pseudacris crucifer	x	x	
Pseudacris feriarum	x	x	x
Scaphiopus holbrookii	x	x	
Rana catesbeiana	x	x	x
Rana clamitans	x	x	x
Rana palustris	x		x
Rana sphenocephala	x	x	x
Rana sylvatica	x		
Gastrophryne carolinensis		x	
Salamanders			
Ambystoma opacum	x		
Eurycea bislineata	?	?	
Hemidactylium scutatum	x		
Plethodon cinereus	x	x	x
Notophthalmus viridescens		x	
Turtles			
Caretta caretta	x	x	x
Chelonia mydas		x	x
Lepidochelys kempii		x	x
Dermochelys coriacea	x	x	x
Chelydra serpentina	x	x	x

Table 1 (continued).

Species	Accomack	Northampton	Barrier Islands
Chrysemys picta	x	x	x
Clemmys guttata	x	x	x
Malaclemys terrapin	x	x	x
Pseudemys rubriventris	x	x	x
Terrapene carolina	x	x	x
Kinosternon subrubrum	x	x	x
Sternotherus odoratus	x		
Lizards			
Sceloporus undulatus	x	x	x
Eumeces fasciatus	x		
Eumeces laticeps		x	
Scincella lateralis	x	x	x
Snakes			
Carphophis amoenus	x	x	
Coluber constrictor	x	x	x
Diadophis punctatus	x		x
Elaphe obsoleta	x	x	x
Heterodon platirhinos	x	x	x
Lampropeltis getula	x	x	x
Nerodia sipedon	x	x	x
Opheodrys aestivus	x	x	x
Storeria dekayi	x	x	x
Thamnophis sauritus		x	
Thamnophis sirtalis	x	x	?
Agkistrodon contortrix	x	x	

Reptile and Amphibian Survey of the Clinch Mountain Wildlife Management Area

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The Clinch Mountain Wildlife Management Area (WMA) of southwestern Virginia is the second largest management area owned and operated by the Virginia Department of Game and Inland Fisheries (VDGIF). The geographic location of the management area in addition to the topography and diversity of habitats allow for the occurrence of a rich and unique species assemblage. The property is situated in the mid-Appalachian mountain range within the upper Tennessee drainage. This area is known for its diversity of fish, mussels, amphibians, and reptiles. In Virginia, many species such as the common map turtle (*Graptemys geographica*), blotchside logperch (*Percina burtoni*), mudpuppy (*Necturus maculosus*), and shiny pigtoe mussel (*Fusconaia cor*) only occur in this drainage. Because of the high elevation, many species known from this area are typically associated with northern latitudes. Red spruce (*Picea rubens*), northern flying squirrel (*Glaucomys sabrinus*), and northern saw-whet owl (*Aegolius acadicus*) are present on the management area. The diversity of aquatic and terrestrial habitats on the management area includes numerous headwater streams, wetlands, boreal forests, high elevation open rock faces, and steep ravines.

Thorough surveys on the Clinch Mountain WMA have been scarce. The VDGIF has conducted limited surveys in portions of the management area for the purpose of developing management plans. Department personnel and contractors have conducted surveys for the northern flying squirrel and plants. Over the last several years, the department has been studying habitat use of ruffed grouse (*Bonasa umbellus*) and monitoring populations of the

eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*). Most accounts of reptiles and amphibians on the management area have been through incidental observations by department biologists and visitors. No comprehensive surveys have been conducted on these groups.

The Virginia Herpetological Society (VHS) annually selects and surveys areas of the state for reptiles and amphibians. These sites are distributed throughout Virginia and focus on areas in need of additional sampling. Selection criteria require that the site can be resurveyed again in the future. Herein we report the finding of the society's survey on the Clinch Mountain WMA.

Study Site

The Clinch Mountain WMA covers 62,928 ha (25,477 ac) partitioned into one large tract on Beartown, Flattop and Clinch Mountains and several smaller parcels along the North Fork Holston River (Figure 1). The property is located 4.8 km (3 mi) north of Saltville and encompasses parts of Russell, Smyth, Washington, and Tazewell counties. The land is actively managed for deer, bear, and turkey, and hunting is allowed for small game (e.g., rabbit, squirrel, and grouse). Timber is selectively harvested for management of game habitat and profit. From April to September, the VDGIF daily stocks rainbow (*Onchorhynchus mykiss*), brown (*Salmo trutta*), and brook (*Salvelinus fontinalis*) trout in Big Tumbling Creek to support a fee-fishing program. Laurel Bed Lake has been actively limed with calcium carbonate (CaCO3) over the last two years to increase pH for a brook trout fishery. Elevations on Clinch Mountain WMA range from 488 m (1,600 ft) to 1,432 m (4,700 ft). The property is within the North Fork Holston River watershed in the Ridge and Valley physiographic province. The topography is mountainous and steep. Flat portions occur on mountain tops and on the flood plain of the North Fork Holston River. Big Tumbling Creek descends through a steep gorge with large boulders and several spectacular waterfalls. Large, open rock outcrops are common along the ridgetops. Numerous beaver dams along several streams cause flooded woodlands and wetlands on the management area.

Before the Clinch Mountain WMA was founded in 1961, the majority of the property was owned by the Stuart Land and Cattle Company, which grazed

livestock and harvested timber. Several old homestead sites including an abandoned school, church, and gristmill, are evidence of the agricultural community that previously existed along Big Tumbling Creek. Because of the inaccessible terrain, a virgin forest of hardwoods and conifers was spared until the late 1920's and early 1930's. Logging by means of mule, ox, and narrow-gauge railway soon cleared most timber. Removal of the forest was soon followed by the loss of American chestnut (*Castanea dentata*) due to blight. The current second growth forest community is comprised of oaks (*Quercus* sp.), hickories (*Carya* sp.), maples (*Acer* sp.), beech (*Fagus grandifolia*), popular (*Populus* sp.), birches (*Betula* sp.), black cherry (*Prunus serotina*), and eastern hemlock (*Tsuga canadensis*). Red spruce is found at higher elevations. Laurel Bed Lake is a 121 ha (300 ac) impounded section of Laurel Bed Creek created in 1964 to supplement water for the fee fishing area.

Materials and Methods

Sampling by the VHS was conducted from May 14-17, 1998. Six teams of 3-6 individuals sampled pre-selected sites in the management area. These sites were selected to cover a wide variety of aquatic and terrestrial habitats. Male vocalizations and direct observations were used to document frogs. We found terrestrial salamanders by overturning rocks and logs in open and forested areas. Survey techniques for stream-dwelling salamanders included overturning cobble, boulders and woody debris in perennial and intermittent streambeds. Hellbenders were sampled using mask and snorkel techniques at night. Chickenwire traps baited with fish were used to sample aquatic turtles. Snakes were collected by overturning cover objects such as sheet metal and boards and by incidental observation. Habitat and behavior were recorded for each observation.

Results

A total of 18 amphibian and 10 reptile species was observed during our survey. An annotated checklist of these species follows; letters in brackets refer to sampling locations shown on the map (Figure 1).

Amphibians

1. *Aneides aeneus* (Green salamander) - [E]

One adult was collected at night on a large moss-covered sandstone boulder in a steep ravine.

2. *Cryptobranchus alleganiensis alleganiensis* (Eastern hellbender) - [W]

One adult hellbender was collected at night in a large pool in Big Tumbling Creek.

3. *Desmognathus fuscus fuscus* (Northern dusky salamander) - [C, G, I, O]

Fourteen specimens were found in small streams and ditches under cobble and boulders. Several specimens were observed under rocks in a dry creek bed. Both juveniles and adults were found.

4. *Desmognathus monticola* (Seal salamander) - [C, G, O]

A total of 57 individuals was found during our survey. This abundant salamander was found under cobble in perennial and intermittent forested streams. Adults and young were collected, including one gravid female.

5. *Desmognathus ochrophaeus* (Allegheny mountain dusky salamander) - [A, B, E, G, I, J, L, N, O, R, V]

This was an abundant salamander, with 118 observations made during our survey. Young and adults were found. Habitat was near stream margins or wetted areas such as seeps, rotten logs, and cobble.

6. *Eurycea cirrigera* (Southern two-lined salamander) - [A, Q]

Two individuals, an adult and a larva, were observed during our survey. Habitat was under cobble in a perennial stream and in leaf litter on the forest floor.

7. *Eurycea longicauda longicauda* (Long-tailed salamander) - [G]

One specimen measuring 35 mm SVL and 86 mm TL was observed on a slope near the North Fork Holston River.

8. *Gyrinophilus porphyriticus porphyriticus* (Northern spring salamander) - [E]

A single immature was captured in a headwater stream.

9. *Notophthalmus viridescens viridescens* (Red-spotted newt) - [A, B, K, M, R]

A total of 51 individuals was found in both aquatic and terrestrial habitats. Efts were present under rocks and rotten logs near streams, ponds, and rivers. Adults were present in wetland ponds and in Laurel Bed Lake.

10. *Plethodon cinereus* (Red-backed salamander) - [L, N, V]

A total of 67 individuals, including both young and adults, was found during this survey. Habitat was heavily wooded areas under rocks and rotten logs.

11. *Plethodon glutinosus* (Northern slimy salamander) - [B, E, L, R]

Twelve adult specimens were confined to high elevation, forested areas under rocks and rotten logs. Young and adults were present.

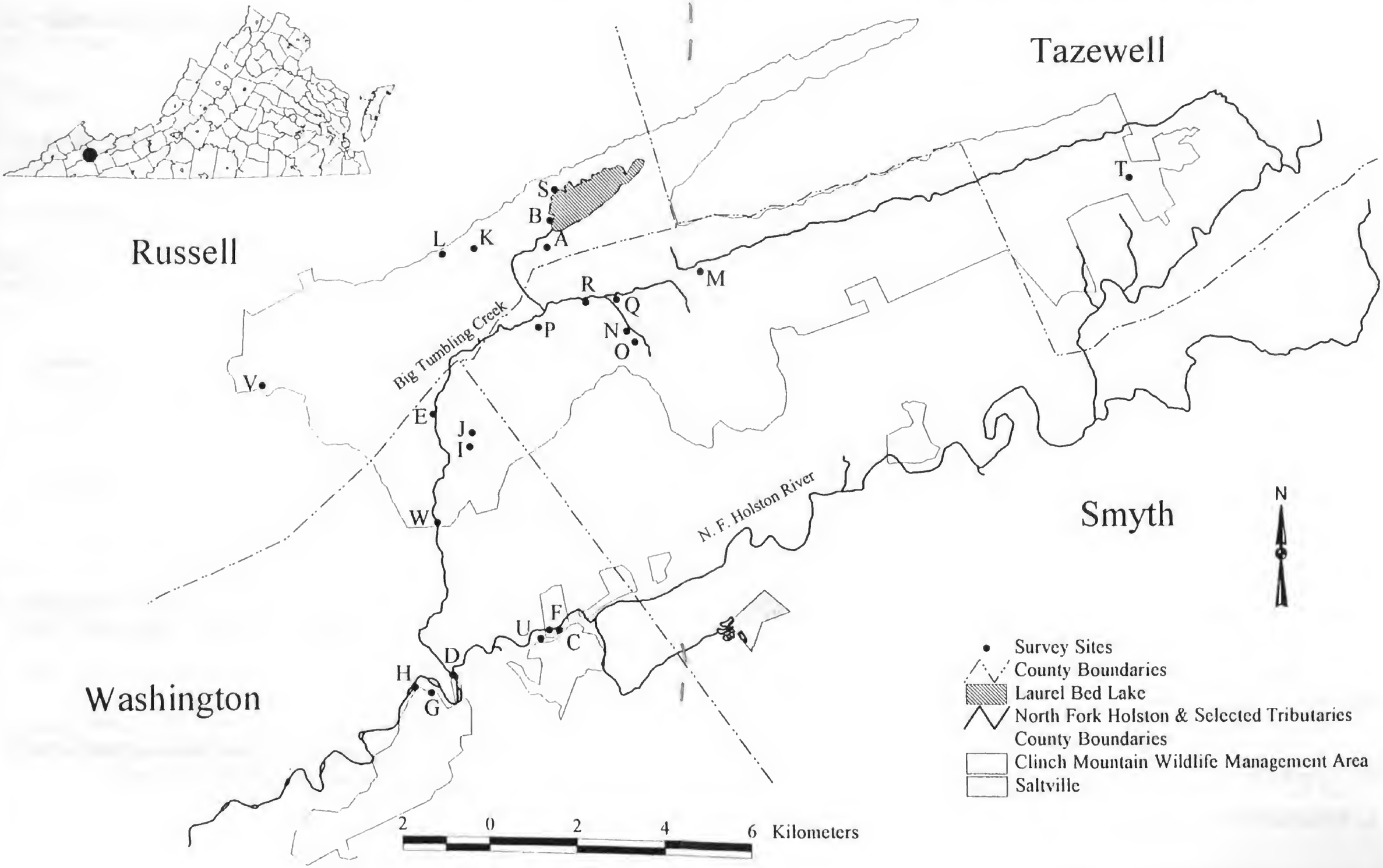
12. *Plethodon jordani* (Jordan's salamander) - [B, E, L, M, N, R, V]

A total of 127 individuals was collected during this survey. These included adults and juveniles. Habitat was ridgetop forests and steep ravines under rocks and rotten logs.

13. *Plethodon richmondi* (Ravine salamander) - [E, V]

Three specimens (2 adults, 1 subadult) were found at two sites. Habitat was under damp logs along a dry ridge and near a headwater stream.

Clinch Mountain Wildlife Management Area



14. *Bufo americanus* (American toad) - [D, G]

Toads were heard calling and eggs were observed in a small pool alongside the North Fork Holston River.

15. *Pseudacris crucifer crucifer* (Northern spring peeper) - [A, B, H, M, P]

Spring peepers were heard calling and observed in high and low elevation sites along perennial streams, flooded meadows, and in the riparian areas of the North Fork Holston River.

16. *Rana catesbeiana* (Bullfrog) - [B]

Several bullfrog tadpoles were collected along the shoreline of Laurel Bed Lake.

17. *Rana clamitans* (Green frog) - [M, O, P]

Six adults (4 observed, 2 heard) were found at three sites. Habitats were the edge of a pond, small streams, and wetlands.

18. *Rana palustris* (Pickerel frog) - [A, M]

Five pickerel frogs were observed at two sites. These included adults and juveniles. Specimens were in the grassy edge of perennial streams.

Reptiles

19. *Apalone spinifera spinifera* (Eastern spiny softshell turtle) - [G, H, U]

Approximately 15 specimens were observed in the North Fork Holston River. Individuals were seen basking on the riverbank and on large rocks. Both adults and juveniles were noted.

20. *Chelydra serpentina* (Common snapping turtle) - [G, H, O, T]

Six individuals were found during our survey in a wide variety of habitats.

Individuals were observed basking on large rocks in the North Fork Holston River, sitting in a mountain pond, and traversing a grassy meadow on Flattop Mountain. One individual was caught in a wire trap in the North Fork Holston River. Two specimens measured 175 mm CL and 164 mm CL, respectively.

21. *Graptemys geographica* (Common map turtle) - [G, H, U]

Over 17 turtles were observed in the North Fork Holston River. Specimens were seen basking on large rocks and overhanging tree limbs. Adults, subadults, and juveniles were noted during our survey.

22. *Terrapene carolina carolina* (Eastern box turtle) - [C, G, O]

Four adult box turtles (3 females, 1 male) were found during our survey. Turtles were found resting and crawling in grassy fields and in the riparian areas of the North Fork Holston River.

23. *Agkistrodon contortrix mokasen* (Northern copperhead) - [S]

One adult was observed basking approximately 10 m from the shoreline of Laurel Bed Lake.

24. *Diadophis punctatus edwardsii* (Northern ring-necked snake) - [C]

Two specimens were found in a field under sheet metal. The specimens measured 29.2 cm SVL, 36.2 TL and 20.1 cm SVL, 26 cm TL, respectively.

25. *Elaphe obsoleta obsoleta* (Black rat snake) - [F]

One adult (approximately 1.0 m TL) was found in an old stone fireplace in a field.

26. *Lampropeltis triangulum triangulum* (Eastern milk snake) - [D]

One juvenile was found DOR and measured 18 cm SVL and 21 cm TL. Habitat nearby was a grassy field and the riparian buffer of the North Fork Holston River.

27. *Nerodia sipedon sipedon* (Northern water snake) - [A, G]

Of the five individuals that were observed, two were adult females, one an unsexed adult, one immature female, and one was an unsexed juvenile (25 cm TL). A specimen collected below Laurel Bed Lake had a deformed jaw. Specimens were found basking on the banks of perennial streams, under a tarp in a field, and DOR. One specimen was observed molting.

28. *Thamnophis sirtalis sirtalis* (Eastern garter snake) - [G, H, K, V]

Four adult garter snakes were collected in mountain and lowlands of the survey area. Snakes were found near disturbed areas of wrecked cars, abandoned sawmills, in addition to the leaf litter of a mature forest. One adult female measured 530 mm TL.

Discussion

The Clinch Mountain WMA contains a high diversity of habitats resulting in a unique assemblage of reptiles and amphibians. Plethodontid salamanders are well represented on the management area with three species of *Desmognathus*, two species of *Eurycea*, and three species of *Plethodon* collected during the survey. The abundance of fishless, headwater streams and seeps provided excellent habitat for streamside salamanders. Members of the genus *Desmognathus* were the most abundant salamander group found in our survey; with the Allegheny mountain dusky salamander being one of the most abundant salamanders observed and having the broadest distribution among survey sites.

Southwestern Virginia is the northern range limit of Jordan's salamander, which is restricted to cool, mesic forests at elevations above 600-925 m (Petranka, 1998). Survey results indicate forested ridges on the Clinch Mountain WMA provide suitable conditions for an abundance of this species. The ravine salamander, a species associated with steep, rocky habitats (Petranka, 1998) and near the southern limits of its range in southwestern Virginia, was also found on the management area.

Two species of relative rarity and particular interest that were collected during the survey are the eastern hellbender and green salamander. The presence of the green salamander is the second record on the management area. The first record was obtained by C. A. Pague and D. A. Young in 1987 (VDGIF-FWIS). In Virginia, the eastern hellbender occurs only in the Tennessee and New River drainages, and is listed as a species of special concern (Terwilliger, 1991). Local residents and anglers have known about the population on the management area for decades. Because of the intensive fishing pressure on Big Tumbling Creek, specimens are occasionally caught and sometimes killed by anglers using bait (S. Whitcomb, pers. comm.). There is currently a program to educate anglers about this species, but it is unknown whether this effort is helping to reduce the killing of hellbenders.

The North Fork Holston River has a long history of heavy metal contamination from the Olin Chemical Plant at Saltville. Over the last century, fish, mollusks, and other aquatic organisms have been eliminated from this river for many miles below Saltville. Heavy metals can accumulate in tissues of these species, affecting reproduction, growth, and survival. In recent years fish populations have been returning to this river, although a health advisory is still in effect for their consumption. The presence of at least three aquatic turtle species in our survey could be a positive sign that water quality is improving in this river. The absence of musk turtles (*Sternotherus* spp.) from survey collections may be related to the failure of mussels and snails, their primary food items, to recolonize this area of the North Fork Holston River. Further and more intensive surveys would be necessary to determine the presence of these species.

Because of the large size and terrain on the management area, and the diversity of life history strategies employed by reptiles and amphibians occurring on the management area, it was not possible to inventory the entire herpetofauna during our limited survey. A thorough survey of the area would take several years with sampling occurring during different seasons. Surveys during late winter and early spring would have a greater chance of finding ambystomatid salamanders and early-breeding frog species such as the wood frog (*Rana sylvatica*). Although not collected in our survey, timber rattlesnakes (*Crotalus horridus*) are known from the ridgetops of the management area (W. H. Martin, pers. comm.). Habitat for this species, upland hardwoods and mixed oak-pine forests with ledges or talus slopes

(Mitchell, 1994), is found in abundance along the ridgetops of the management area. Spring surveys specifically targeting south-facing ledges and rock outcrops would be the optimal time to sample for this species.

Two habitat types of interest were not sampled during our survey. We were unable to survey the high elevation, boreal forests on Beartown Mountain, habitat similar to that of Mount Rogers, a national recreational area approximately 43 km (26.6 mi) southeast of the Clinch Mountain WMA. Mount Rogers contains such unique species as pygmy (*Desmognathus wrighti*) and Yonahlossee (*Plethodon yonahlossee*) salamanders. Intensive surveys should be conducted on Beartown Mountain in an attempt to document occurrences of these species. In addition, our survey could not locate the opening to the North Fork Holston Cave. This cave is located on management area property on a large bluff in a bend along the North Fork Holston River. Previous records indicate the presence of the cave salamander (*Eurycea lucifuga*) in this habitat.

The Clinch Mountain WMA is a large tract of publicly held land in the upper Tennessee drainage, an area recognized for its extraordinary species diversity. Southwestern Virginia is one of the most faunally diverse regions of North America (Benz and Collins, 1997). Except for property owned by the U.S. Forest Service, this region of Virginia is generally lacking in public land holdings where management plans can provide a degree of protection for species and habitats. Management plans for the Clinch Mountain WMA should protect critical habitat for populations of reptiles and amphibians. Within the management area, many steep areas and those areas inaccessible by road receive little pressure from timbering activities and are therefore protected. At proposed timber sites, potential negative impacts to nongame species, especially reptiles and amphibians, should be evaluated before harvesting begins.

The Clinch Mountain WMA is a unique and important component of Virginia's natural heritage. Because of its diversity of habitat types, scenic beauty, and biotic diversity, an excellent opportunity exists to promote watchable wildlife. Future herpetofaunal surveys will enhance these opportunities, and further inclusive management of all species.

Acknowledgments

The following VHS members participated in this survey: Scott Cooney, David L. Dawson, David A. Dawson, Chris D'Orgeix, Shay Garriock, Faye and Whitney Ferrall, Michael Hayslett, Doug and Natalie Harpole, Jess Jones, McKeever and Bill Henley, Don Mackler, Tom Mathies, Paul Sattler, Mary Rybitski, Gordon Wilson, and Laurie Zuckerman. We apologize for any names inadvertently left off this list. We would like to thank Scott Whitcomb, Clinch Mountain WMA biologist, for his assistance in selecting survey sites and trip planning. VDGIF biologists Danny Harrington and John Baker provided useful information regarding the historical and current management practices on this area.

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FIELD NOTES

Osteopilus septentrionalis (Cuban Treefrog). VA: Fauquier Co., Warrenton. April 1992. Robert C. Simpson.

A single adult was found on an exotic plant in an unnamed Warrenton horticultural nursery on an unknown date in April 1992 and photographed by R. C. Simpson. The specimen was not captured. It was probably a single waif that rafted aboard a horticultural plant transported from a nursery in Florida. Cuban treefrogs were introduced into Florida from their natural range in Cuba and the Bahamas in the late 19th century and established populations in the Florida Keys, subsequently expanding northward into the southern Florida mainland as far north as Orange County (Duellman, W. E. and R. I. Crombie. 1970. Cat. Am. Amph. Rept. 92.1-92.4; Wilson, L. D. and L. Porras. 1983. The Ecological Impact of Man on the South Florida Herpetofauna. Univ. Kansas Mus. Nat. Hist., Spec. Publ. No. 9, 89 pp.; Ashton, R. E., Jr. and P. S. Ashton. 1988. Handbook of Reptiles and Amphibians of Florida, Part 3, The Amphibians, Windward Publishing Co., Miami, FL. 191 pp.; Conant, R. and J. T. Collins. 1998. A Field Guide to Reptiles and Amphibians of Eastern and Central North America. 3rd expanded ed., Houghton Mifflin Co., Boston, MA. 450 pp.). The observation in Virginia suggests a single rafting event, as there is no known established population. This is the first record of this species in Virginia. It should be considered an accidental introduction. The color slide has been deposited in the Virginia Herpetological Society Slide Collection at the Virginia Museum of Natural History.

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Thamnophis sirtalis sirtalis (Eastern Garter Snake).VA: City of Lynchburg, 408 Lakewood Street. 6 December 1998. Mallory P. and Gordon L. Wilson.

On the afternoon of 6 December 1998, my daughter caught a juvenile *Thamnophis sirtalis sirtalis* in our neighbor's backyard. It was unseasonably warm (high 60's to low 70's) and the snake was basking in the sun. We released it later that day. Garter snakes can be found every month of the

year in Virginia, with the latest recorded observation being 9 December (Mitchell, J. C. 1994. The Reptiles of Virginia. Smithsonian Institution Press, Washington, D.C. 352 pp.). Our observation was only three days earlier than the record late date and confirms that some snakes can be found year round in Virginia if temperatures are appropriate.

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Plethodon cinereus (Red-backed Salamander). VA: Westmoreland Co., Westmoreland State Park. 8 April 1999. Steven M. Roble.

The red-backed salamander is one of the most widespread and abundant salamanders in eastern North America and is typically found in forested habitats (Conant, R. and J. T. Collins. 1998. A Field Guide to Reptiles and Amphibians of Eastern and Central North America. 3rd expanded ed., Houghton Mifflin Co., Boston, MA. 450 pp.; Petranka, J. W. 1998. Salamanders of the United States and Canada. Smithsonian Institution Press, Washington, D.C. 587 pp.). While walking along the Potomac River shoreline, I discovered a lead phase adult at 1725 h under a piece of driftwood slightly beyond the normal high tide line. Conditions were sunny and ca. 75° F, although this portion of the beach was shaded at the time (in full sun several hours earlier). The beach was ca. 13 m wide and bordered by a steep forested cliff (ca. 50 m high). The nearest vegetation was at the base of the cliff, ca. 5 m from the capture site. Several moist deciduous tree leaves were present below the driftwood, apparently creating a suitable microhabitat for the salamander in an area otherwise dominated by bare sand, fine gravel, and numerous other pieces of driftwood.

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Rana catesbeiana (Bullfrog). VA: Accomack Co., Assateague Island, Chincoteague National Wildlife Refuge, June-October 1998. Steven M. Roble and Anne C. Chazal.

Mitchell and Anderson (1994. Amphibians and Reptiles of Assateague and Chincoteague Islands. Virginia Museum of Natural History Special Publication Number 2. 120 pp.) reported that bullfrogs were probably introduced onto Assateague Island and were known only from the waterfowl impoundments near the southern end of the island. Our conversations with Irvin Ailes, wildlife biologist for Chincoteague National Wildlife Refuge, confirm that a local naturalist intentionally released bullfrogs onto Assateague Island several decades ago. During the course of an insect survey of Chincoteague National Wildlife Refuge (which includes the Virginia portion of Assateague Island) during the summer and fall of 1998, we encountered bullfrogs at six different wetlands north of the waterfowl impoundments. Habitats included temporary and semipermanent ponds, ditches, and swamps. One of the ponds was within 4 km (2.5 mi) of the Maryland state line and approximately 7.5 km (4.7 mi) north of the northernmost waterfowl impoundment. Two other nearby breeding ponds were located ca. 300 m and 700 m to the south, respectively. The summer of 1998 was characterized by below average rainfall, and several sites where bullfrogs were recorded in June and early July were dry 3-6 weeks later. We observed all life stages of this species except eggs; several very large tadpoles (total length nearly 13 cm) were found. Our observations indicate that bullfrogs are well established and considerably more widespread, albeit in low densities, on Assateague Island than was suggested by Mitchell and Anderson (op. cit.).

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Thamnophis sauritus sauritus (Eastern Ribbon Snake). VA: Grayson Co., Big Spring Bog Natural Area Preserve, 9 km S Galax. 30 March 1999. Steven M. Roble and Claiborn A. Woodall.

A subadult ribbon snake (total length ca. 30 cm) was observed at 1600 h in the small fen, a rare grass and sedge-dominated wetland habitat, portion of the preserve. Mitchell (1994. The Reptiles of Virginia. Smithsonian Insitution Press, Washington, D.C. 352 pp.) plotted numerous records for this species in eastern Virginia, but knew of only six localities in the western portion of the state, including two sites west of the New River (both in extreme western Grayson County). The natural area preserve is located in the southeastern corner of Grayson County, east of the New River.

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Amphibians and Reptiles of Fort Lee: Addendum

Roble and Hobson (1998. Catesbeiana 18[2]: 35-42) documented the occurrence of 21 species of amphibians and reptiles on the Fort Lee Military Reservation in Prince George County, Virginia. The report failed to mention the capture of a ground skink (*Scincella lateralis*) on 3 June 1993 in a forested area near the Blackwater Swamp.

President's Corner

Hello again VHS members! Let me begin by wishing everyone a happy although belated new year. If 1999 is anything like 1998, we certainly have a lot to look forward to. The big event in 1998 was of course the VHS 40th anniversary meeting. This event was by far one of the best attended society meetings I've ever seen. Our speakers were terrific and provided an excellent forum on the issues related to Virginia's herpetofauna. At the meeting, long-time member Frank Tobey was awarded the first VHS Lifetime Achievement Award. This award is given to members who have made important contributions and exhibited a positive image and knowledge of Virginia's herpetofauna. Frank exemplifies these traits. Frank wrote me after the meeting and asked to thank all who nominated him and said that he is extremely grateful and will display the award in a prominent place in his home. I would like to make the lifetime achievement award available to many more worthy candidates. If you know of someone who has significantly contributed to Virginia's herpetology, bring their name to the next VHS meeting and we will discuss their nomination for the award.

We continue to see our membership rise over the last year. Unfortunately, we also see the costs of printing, postage, and other items increase. Because of these financial constraints, the membership recently voted to raise the current membership dues. Beginning January 1, 2000, regular membership will rise to $15.00, family $20.00, Student/Youth $8.00, and life $225.00. While no one likes to pay more for anything, I feel that the move was unavoidable and that it was necessary to help us remain solvent for many years. With this small increase in dues, we will be able to maintain the high quality of publications and events members have come to expect from the VHS.

On the environmental front, there is a new menace threatening Virginia's reptiles and amphibians called wood chip mills. Wood chip mills grind trees, branches and all, from the smallest sapling to the mightiest oak, into small quarter size chips that are made into low grade paper products such as toilet paper and napkins. Chip mills can produce approximately 250,000 tons of chips each year and use 10 to 20 times the wood used by an average sawmill. Many people are justifiably worried that as more chip mills come into Virginia the amount of clear-cutting will also increase. According to the Roanoke Times, Virginia has three mills in operation and one proposed in Dickenson County in the near future. Virginia can expect many more of these mills based on the industry's growth in other states and because of

Virginia's maturing second growth forest. Advocates of chip mills claim that they simply use wood that would be left on the ground to rot. I guess these people don't know how soil is made or where *Plethodon* salamanders live. Concerned about the increase in cutting, a bill was passed during the last General Assembly session that allows for a two-year study to determine the effects of chip mills on Virginia's environment. Additionally, there has been an effort to put a moratorium on the construction of any new mills until the study is completed and the results can be assessed. I feel this is a safe measure and I will be drafting a resolution supporting this effort that will be presented and voted upon at the spring meeting. I encourage all members to write letters to Governor Gilmore and Secretary of Natural Resources John Paul Woodley supporting this measure. As the only society solely committed to the conservation of Virginia's herpetofauna, it is our responsibility to voice our opinion to protect those species that normally would be overlooked and ignored.

Spring - the season when a herpetologist dreams of amphibian-filled ponds and reptiles awaking from their winter slumber. On May 21-23, 1999, your dreams will come true when the VHS conducts a reptile and amphibian survey on Twin Lakes State Park and surrounding areas. Twin Lakes State Park is in Prince Edward County located in the rolling Piedmont of south central Virginia. President-elect Bob Greenlee has been busy contacting landowners and setting up survey sites for our field trip. This area has a vast number of creeks, wetlands and man-made lakes where herps of every size, shape, and color shouldn't be in short supply. We will be having our spring business meeting on May 21st in Farmville. Please see the information in this issue for directions and additional details of this event. Until then, I wish everyone good health and happy herping.

Mike Pinder
President

Minutes of the VHS Fall Meeting
Maymont Park
Richmond, Virginia
October 31, 1998

1045: Meeting called to order by VHS President Mike Pinder, followed by introductions of all those present.

1050: Treasury Report: Shay Garriock gave a copy of the treasury report to all those present. Steve Roble noted a discrepancy in the mailing costs of *Catesbeiana* 18(2): the correct cost was about 10 dollars less than the reported cost. [The reported cost was $129.75, however the true cost was $117.33.] Joe Mitchell noted that funding for the Snake Poster was not mentioned in the printed report, and Shay clarified that all moneys allocated to the poster, totaling $550, were included in the stated balance. Both Joe Mitchell and Ron Southwick commented that there should also be an additional $500 provided by VDGIF as well as money from a lifetime membership purchased by Chris Pague. Mike agreed to research past records in order to evaluate the history of the snake poster fund. Joe Mitchell expressed concern over the low balance of available treasury funds. Discussion followed to explain reasons for the treasury decline, including recent purchases of T-shirts, increased printing and postage cost of *Catesbeiana*, and the time of year (when no membership dues are being received.)

1056: Mike introduced Steve Roble as the new Catesbeiana Editor and thanked the former editor, Paul Sattler, for his years of service to the VHS. The Bulletin Editor Report was given by Steve Roble. *Catesbeiana* 18(2) was 48 pages in length, being the largest VHS bulletin ever printed. 200 copies were printed and 153 mailed to membership at a cost of 78 cents per copy. This postage is an increase over the previous 55 cents because of the increased number of pages and hence weight. Steve also suggested that printing costs had increased because available vendor sources were now in Richmond instead of Lynchburg. Mike suggested that a less expensive source of printing and a limit to the number of pages would reduce the cost. Ron Southwick mentioned raising membership dues to cover rising costs.

1102: Newsletter Editor Report: 151 copies of Volume 8 (2) were sent out to membership at a cost of 32 cents per copy. Those present were encouraged to provide relevant information and artwork for future newsletter publications.

1104: New Business Discussion: Mike read the proposed amendments to Article VI of the BY-LAWS, addition of Sections 3 and 4, concerning additional membership dues guidelines. Steve Roble suggested that a later date than January 1 would be more appropriate for the mailing of dues reminder cards, since many members would pay dues early in the year voluntarily. Waiting until February 1 would reduce the number of reminder cards necessary and in turn reduce postage costs. Membership voted unanimously in favor to re-word Section 3 to: Membership dues reminder notices will be sent to membership on February 1 of each year to members who have not paid dues for the current calendar year. A great deal of discussion followed concerning the addition of Section 4 stating that, for those joining the society after September 1, membership dues will be applied to the following calendar year. The main issue was whether or not to give those members joining after September 1 a gratis issue of *Catesbeiana* and the newsletter, as has been done recently. Several suggestions were made to the executive committee, and Section 4 was passed as worded by unanimous vote. The addition of Sections 3 and 4 to Article VI of the BY-LAWS was voted on by membership and carried by greater than a two-thirds majority.

1115: Proposed amendments of Article IX of the BY-LAWS (concerning description of the VHS Seal) were read to membership. The executive committee brought forth this amendment to try to restore the original seal while making changes to the placement of the snake and salamander. A great deal of discussion ensued. Members questioned the specified detail in the amendment, the shape and placement of the black snake, and the necessity of constraining seal design by written details in the constitution. The amendment was voted on as written with 4 in favor and 5 in opposition, not obtaining a two-thirds majority to pass. Steve Roble suggested creating a more vague description. A motion was made to make the following changes to the proposed amendment with intent of keeping the snake and salamander size and placement more open to interpretation, and the motion

was carried by a unanimous vote:

1. A silhouette of a Black Rat Snake will be placed in the western portion of the state to represent the reptiles native to Virginia.

2. The likeness of a Spotted Salamander will be placed in the southeastern part of the state to represent the amphibians native to Virginia.

1145: The proposed addition of Article X, Section 1 to the BY-LAWS, concerning the creation of a student lodging fund (SLF), which would offer financial assistance to students attending VHS field trips, thus promoting participation by student members. The opening of discussion brought forth a general consensus by those present that, given the current status of the VHS Treasury, not enough money would be available for such a fund. It was also suggested that proceeds from the sale of raffle tickets, auction items, and T-shirts could not provide an adequate, dependable funding source. Paul Sattler suggested a trial period of one year prior to a constitutional amendment. The amendment as worded was then voted on and unanimously opposed. It was motioned that the executive committee reassess the necessity of the fund as a constitutional amendment, and to make suggested changes. The motion was carried by a unanimous vote.

1200: Potential locations for the 1999 Spring Meeting were discussed. Camp Blue Ridge and Twin Lakes State Park were the only two suggested locations. No final decision was made as to where the meeting and survey will be held.

1204: The Snake Brochure was discussed. Joe Mitchell said that he had signed the contract to begin work on the project. Mike solicited the membership for snake photographs. Photographs chosen to be published in the brochure would be under a lease agreement and given appropriate credit. Mike said he has a list of six photographs already submitted. The completion timeline for the free brochure is Summer 1999.

1210: Shay reported that because of low treasury funds and uncertainty about the VHS logo, that no plans were presently being made to purchase VHS coffee mugs.

1212: Ron Southwick suggested raising membership dues to compensate for rising costs of printing and postage costs, among other things. Steve Roble stated that VHS membership fees were in fact below those of some other Virginia Societies, and that the year 2000 would be a good time to begin a dues increase. Discussion followed concerning whether or not a dues increase would affect the number of members, and what values membership dues should be raised to. It was also decided to keep the "Family" category although several persons questioned its benefit to the Membership. A motion was made to raise VHS membership dues to the following values beginning January 1, 2000.

Regular	$ 15.00
Family	$ 20.00
Student/Youth	$ 8.00
Life	$225.00

The motion was carried.

1230: It was suggested that the VHS again seek out federal tax exempt status (501C designation), since previous efforts had no outcome. A motion was made that the executive committee research the requirements for obtaining tax exemption and to file for 501C designation. The motion was carried.

1235: Meeting adjourned

Shay Garriock
Secretary/Treasurer

Treasurer's Report, March 23, 1999

Total Balance on hand October 26, 1998 (minus $9.95 error from previous report)	**$2304.90**

Receipts:

Membership dues	$1127.00
T-shirt sales	$ 435.00
Bumber stickers	$ 11.00
Book sales	$ 37.38
Auction	$ 213.00
Raffle	$ 218.00
1998 Teacher's Workshop	$ 110.00
Registration for Fall Meeting	$ 161.00
Deposit return from Maymont	$ 100.00
Savings account earned interest	$ 17.56
Total receipts	$2429.94

Disbursements:

Webpage advertisement	$ 40.00
Printing for additional copies of Newsletter 8(2)	$ 65.95
Postage for Newsletter 9(1)	$ 58.82
Miscellaneous postage and stamps	$ 71.69
Printing for 1999 dues reminder cards	$ 5.13
Postage for 1999 dues reminder cards	$ 16.00
Office Supplies:	
Microcassette	$ 34.95
Cash till	$ 27.15
Raffle tickets	$ 6.26
Receipt book	$ 3.65
Miscellaneous and tax	$ 14.96
Award	$ 40.00
Food for Fall Meeting	$ 205.49
Total disbursements	$ 590.05

Treasurer's Report

Balance on hand March 23, 1999

Checking	$2604.63
Savings Account: Snake Brochure Fund	
VDGIF (1990)	$ 500.00
SSAR (1990)	$ 300.00
Other donations (1990-91)	$ 125.00
Account activation deposit (1998)	$ 172.50
Earned interest + unknown sources	$ 442.66
	$1540.16
Total	**$4144.79**

The society has a current membership of 161
New members since last Treasury Report = 24

Shay Garriock
Secretary/Treasurer

ANNOUNCEMENT
SPRING 1999 MEETING OF THE
VIRGINIA HERPETOLOGICAL SOCIETY

This year we will be surveying on Prince Edward - Gallion State Forest, Sailors Creek State Park, Twin Lakes State Park and surrounding areas in Prince Edward County, Virginia. Access to survey locations is primarily via paved or gravel roads. However, travel along unpaved roads will be necessary to reach some sites, therefore those with 4WD vehicles are encouraged to bring 'em on. USGS 7.5' topographic maps (1:24,000 scale) and a list of potential species will be provided to each survey group.

The business meeting and slide show of potential species will be Friday, May 21st in Farmville, at "The Old Firehouse".

Directions to "The Old Firehouse", Farmville, Virginia:
Take Hwy 460 east from Lynchburg, or west from Petersburg, to Farmville. From Hwy 460 go north on Main Street to 4th Street. Turn right on 4th, then go one block and turn left on South Street. Go 1/2 block to right into the parking lot behind the firehouse. VHS will be meeting on the second floor.

Directions to Twin Lakes State Park:

From Burkeville: Travel Route 360 west approximately 5 miles, then turn right on Route 613. Travel two miles to the park entrance and follow VHS signs.

From Farmville: Take Route 460 east approximately two miles and turn right on Route 696, follow signs to the park approximately 11 miles from Hwy 460. Follow VHS signs.

Schedule:

Friday May 21, 1999

7:00 PM	Business Meeting ("The Old Firehouse")
8:00 PM	Snack
8:15 PM	Slide Show and coordination meeting for survey on Saturday
9:00 PM	Adjourn

Spring Meeting Announcement

Saturday May 22, 1999

8:00 AM	Coordination meeting at Twin Lakes State Park Picnic Shelter
8:30 AM	Break into survey groups and head to designated survey locations
12:30 PM	Survey groups are free to survey outside of their respective survey stations.
7:00 PM	Meet (location TBA) to return data forms and maps, compile survey data, compare survey adventures and battle scars, and return borrowed equipment.

Sunday May 23, 1999

8:00 AM	Survey on your own.

Accommodations:

Lodging is available at a number of locations surrounding Twin Lakes State Park. VHS has obtained discounts at the Days Inn (804-392-6611) with a rate of $56 plus tax, and at the Super 8 (804-392-8196) with a rate of $50 plus tax. These accommodations, along with a Comfort Inn, are located in Farmville on Main Street (Route 15 N), near the Hwy 460-Route 15 interchange.

Equipment List:

Sampling equipment: field guides, camera, binoculars, collection jars and bags, snake stick, seines and dip nets

Waders, compass, rain gear, insect repellent

Canoes, life preservers, throw-type flotation device

Twin Lakes State Park & Prince Edward-Gallion State Forest Potential Species List

Ambystoma maculatum	Salamander, spotted
Ambystoma opacum	Salamander, marbled
Ambystoma talpoideum	Salamander, mole
Desmognathus fuscus	Salamander, northern dusky
Desmognathus monticola	Salamander, seal
Eurycea cirrigera	Salamander, southern two-lined
Eurycea guttolineata	Salamander, three-lined
Hemidactylium scutatum	Salamander, four-toed
Notophthalmus viridescens viridescens	Newt, red-spotted
Plethodon cinereus	Salamander, red-backed
Plethodon cylindraceus	Salamander, white-spotted slimy
Pseudotriton montanus montanus	Salamander, eastern mud
Pseudotriton ruber ruber	Salamander, northern red
Siren lacertina	Siren, greater
Acris crepitans crepitans	Frog, northern cricket
Bufo americanus	Toad, American
Bufo fowleri	Toad, Fowler's
Gastrophryne carolinensis	Toad, eastern narrowmouth
Hyla chrysoscelis	Treefrog, Cope's gray
Hyla versicolor	Treefrog, gray
Pseudacris crucifer crucifer	Peeper, northern spring
Pseudacris feriarum	Frog, upland chorus
Rana catesbeiana	Bullfrog
Rana clamitans melanota	Frog, green
Rana palustris	Frog, pickerel
Rana sphenocephala	Frog, southern leopard
Rana sylvatica	Frog, wood
Scaphiopus holbrookii holbrookii	Spadefoot, eastern
Chelydra serpentina	Turtle, common snapping
Chrysemys picta picta	Turtle, eastern painted
Kinosternon subrubrum subrubrum	Turtle, eastern mud
Pseudemys concinna concinna	Cooter, eastern river
Sternotherus odoratus	Turtle, common musk
Terrapene carolina carolina	Turtle, eastern box

Cnemidophorus sexlineatus sexlineatus	Racerunner, six-lined
Eumeces fasciatus	Skink, five-lined
Eumeces inexpectatus	Skink, southeastern five-lined
Eumeces laticeps	Skink, broad-headed
Ophisaurus attenuatus longicaudus	Lizard, eastern slender glass
Sceloporus undulatus hyacinthinus	Lizard, northern fence
Scincella lateralis	Skink, ground
Agkistrodon contortrix mokasen	Copperhead, northern
Carphophis amoenus amoenus	Snake, eastern worm
Cemophora coccinea copei	Snake, northern scarlet
Coluber constrictor constrictor	Racer, northern black
Diadophis punctatus edwardsii	Snake, northern ring-necked
Diadophis punctatus punctatus	Snake, southern ring-necked
Elaphe guttata guttata	Snake, corn
Elaphe obsoleta obsoleta	Snake, black rat
Heterodon platirhinos	Snake, eastern hognose
Lampropeltis calligaster rhombomaculata	Kingsnake, mole
Lampropeltis getula getula	Kingsnake, eastern
Lampropeltis triangulum triangulum	Snake, eastern milk
Nerodia sipedon sipedon	Snake, northern water
Opheodrys aestivus	Snake, rough green
Regina septemvittata	Snake, queen
Storeria dekayi dekayi	Snake, northern brown
Storeria occipitomaculata occipitomaculata	Snake, northern red-bellied
Tantilla coronata	Snake, southeastern crowned
Thamnophis sauritus sauritus	Snake, eastern ribbon
Thamnophis sirtalis sirtalis	Snake, eastern garter
Virginia valeriae valeriae	Snake, eastern earth

MEMBERSHIP APPLICATION

I wish to _____ initiate _____ renew membership in the Virginia Herpetological Society for the year _____ 1999 _____ 2000.
(Note: dues will increase effective in the year 2000.)

___ I wish only to receive a membership list. Enclosed is $1.00 to cover the cost.

Name _____
Address _____
_____
_____ Phone _____
email address: _____

Dues Category: ____ Regular - $10.00 (1999); $15.00 (2000)
____ Family - $12.50 (1999); $20.00 (2000)
____ Under 18 - $6.00 (1999); $8.00 (2000)
____ Life - $150.00 (1999); $225.00 (2000)

Interests: ____ Reptiles ____ Amphibians ____Captive Husbandry
____ Distribution ____ Research
____ Specifically _____

Make checks payable to the Virginia Herpetological Society and send to the treasurer: Shay Garriock, VHS Secretary/Treasurer, 8622 Chapel Hill Road, Cary, NC 27513

Visit the VHS web site at: http://vhsociety.home.mindspring.com/

Field Notes

This section provides a means of publishing natural history information on Virginia's amphibians and reptiles that does not lend itself to full-length articles. Observations on geographic distribution, ecology, reproduction, phenology, behavior and other topics are welcomed. Field Notes will usually concern a single species. The format of the reports is: Scientific name (followed by common name in parentheses), state abbreviation (VA), county and location, date(s) of observation, observer(s), data and observations. The name(s) and address(es) of the author(s) should appear one line below the report. Consult the editor if your information does not readily fit this format. ALL FIELD NOTES MUST INCLUDE A BRIEF STATEMENT EXPLAINING THE SIGNIFICANCE OF THE RECORD (e.g., new county record) OR OBSERVATION (e.g., unusual or rarely observed behavior, extremely early or late seasonal record, abnormal coloration, etc.). Submissions that fail to include this information are subject to rejection. Relevant literature should be cited in the body of the text (see Field Notes in this issue for proper format). All submissions will be reviewed by the editor (and one other person if deemed necessary) and revised as needed; all changes must be approved by the author(s) before publication.

If the field note contains information on a new county (or state) record, verification is REQUIRED in the form of a voucher specimen deposited in a permanent museum (e.g., Virginia Museum of Natural History) or a color photograph (print or slide) deposited in the archives of the Virginia Herpetological Society. Photographs should be sent to the editor for verification and archiving purposes; the identity of voucher specimens must be confirmed by a museum curator or other qualified person. Include the specimen number if it has been catalogued. Prospective authors of distribution reports should consult Mitchell (1994. The Reptiles of Virginia. Smithsonian Institution Press, Washington, D.C. 352 pp.) and Tobey (1985. Virginia's Amphibians and Reptiles: A Distributional Survey, Virginia Herpetological Society, Purcellville, VA. 114 pp.) to determine if they may have a new county record. Species identification for observational records (e.g., behavior) should be verified by a second person whenever possible.

The correct citation format is: Tobey, F. J. 1989. Field notes: *Coluber constrictor constrictor*. *Catesbeiana* 9(2): 35.

Photographs

High contrast black-and-white photographs of amphibians and reptiles will be considered for publication if they are of good quality and are relevant to an accompanying article or field note. Submissions should be no larger than 5 x 7 inches and printed on glossy paper. Published photographs will be deposited in the archives of the Virginia Herpetological Society.